

REMARKS

Favorable consideration and allowance of the claims of the present application are respectfully requested.

In the present Official Action, the Examiner first rejected Claims 1-9 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for allegedly failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. For example, the Examiner rejects use of the term "said substrate" in Claim 1 as not having sufficient antecedent basis.

Applicant, in response, amends Claim 1 to provide a limitation that provides proper antecedent basis for the rejected term. Wherefore, the Examiner is respectfully requested to withdraw the rejections of the Claims 1-9 under 35 U.S.C. §112, second paragraph.

Further in the Office Action, the Examiner rejected Claims 1 – 6 under 35 U.S.C. §103(a) as allegedly being unpatentable over Leitz et al. (US Patent Publication No. 2004/0075105) (Leitz) in view of Fitzgerald (US 6,555,839) (Fitzgerald). The Examiner further rejected Claims 7 – 9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Leitz in view of Fitzgerald as applied in the rejection of Claims 1-6, and further in view of Ng et al. (US 5,134,447) (Ng).

Applicants respectfully submit that Leitz, whether taken alone or in combination with Fitzgerald, does not relate to the claims of the present invention and does not teach or suggest the device as claimed in rejected Claims 1 – 6, nor does Leitz, whether taken alone or in combination with Fitzgerald and Ng, teach or suggest the device as claimed in rejected Claims 7 – 9.

In particular, the Examiner states on page 3 of the Office Action:

"Fitzgerald discloses in Fig. 6 a semiconductor field effect transistor device that comprises...

...blocking impurity dopant materials that partially or fully occupy the dislocation defects, wherein the blocking impurity dopant material substantially inhibits diffusion of the implanted source and drain dopants from diffusing along the dislocation or crystal defect."

Similarly, the Examiner states on page 5 of the Office Action:

"Ng. et al discloses a semiconductor field effect transistor that comprises a neutral impurity that includes Ge, C, Sn, Si, In and Pb, and wherein the dopants are taught for the disclosed intended purpose of increasing the operational lifetime of the device preventing the formation of hot charge carriers at or near the drain thus inhibiting the diffusion of the implanted source and drain dopants along the substrate."

Applicant respectfully takes issue with these statements and respectfully submits that these statements are incorrect.

Respectfully, neither Leitz nor Fitzgerald nor Ng, mention that p-type or neutral impurities, in the presence of a dislocation that extends continuously from the source region to the drain region, have the action of preferentially occupying that dislocation and therefore have the action of preventing an n-type dopant from diffusing along that dislocation. Furthermore, in Leitz and Fitzgerald, the purpose of the p-type dopants is to act as a barrier for electrical transport (by creating an electrostatic potential barrier), and not a barrier to dopant diffusion. Moreover, the primary reference cited to Leitz does not mention, teach or

suggest in any way that the impurities in the body or channel region could have the additional function and benefit of inhibiting diffusion of implanted source and drain dopants from diffusing along the dislocation or crystal defect between source and drain by the mechanism of preferentially occupying the dislocation atomic sites. This is an entirely new mechanism, which, it is respectfully submitted, has been known or proposed in the prior art.

Respectfully, Ng is of no help in this regard. In Ng, the intended purpose of the neutral impurities is to act as scattering centers, so that the generation of hot carriers near the drain is suppressed, leading to reduced gate oxide trapping, and thus improved reliability. It is absolutely not shown or suggested in Ng that the neutral impurities described by Ng would have the same effect as claimed in the present invention, which is to inhibit dislocation-induced source-to-drain electrical leakage. In fact, Ng, does not even mention dislocations. The structure of Ng is also different, as the neutral impurities in the devices disclosed are provided only in the drain region of the device, not in the body or channel region as in the present invention.


In sum, the action of preventing diffusion can only take place in the presence of a dislocation that extends continuously between the source and drain regions, and therefore, the structure of the present invention as claimed is in fact different than that proposed by Letiz. However, most certainly, the claimed mechanism of blocking impurity dopant materials that partially or fully occupies the dislocation defects, wherein the blocking impurity dopant materials substantially inhibit diffusion of the implanted source and drain dopants from diffusing along said dislocation or crystal defect propose is clearly unique and respectfully, non-obvious.

For these reasons, it is respectfully submitted that Leitz whether taken alone or in combination with Fitzgerald or Ng is not suggestive nor of the present invention as claimed in

amended Claim 1. Accordingly, the Examiner is respectfully requested to withdraw the rejection of Claims 1 and Claims 2-9 as being obvious under 35 U.S.C. §103(a).

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance be issued. If the Examiner believes that a telephone conference with the Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned, Applicants' attorney, at the following telephone number: (516) 742-4343.

Respectfully submitted,


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